POLICY PAPER

Deferred Maintenance and Sustainable Growth

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Introduction

McMaster University is a sprawling campus of over 300 acres, the University first moving to its current location in Hamilton in 1930. Several buildings still in use were constructed around that time, with most other academic buildings constructed during the 20th century. As such our aging campus infrastructure requires constant maintenance. The McMaster Students Union leadership has kept a keen eye on the issue of deferred maintenance, repeatedly bringing it up with to provincial politicians as well as University Administration. However, it is important to conduct a landscape review and catalogue specific recommendations as proposed by stakeholders and the MSU's endorsement of it.

Building and infrastructure maintenance can be addressed in several ways, including routine maintenance, major maintenance and building renewal.

Routine maintenance, funded through the annual operating budget, is considered to be maintenance needed to preserve the facilities and their system components from failure or deterioration. This includes minor routine maintenance ("repair or replacement of obsolete, worn, broken, or inoperative building components" < $25,000), emergency maintenance ("unscheduled work that requires immediate actions to restore services or remove problems that could interrupt activities"), and preventative maintenance ("planned Addressing the University's Deferred Maintenance Backlog and controlled program of periodic inspection, adjustment, lubrication, replacement of components, and performance testing and analysis"). Routine maintenance can also include the correction of small scale fire and life safety, accessibility, and code issues when it is feasible or required to do so. Similarly, major maintenance and building renewal projects comprise a larger investment into existing infrastructure.

However, deferred maintenance is defined as maintenance that has been "deferred on a planned or unplanned basis to a future budget cycle, or postponed until funds are available." Our deferred maintenance backlog is quantified through the identification of maintenance deficiencies through formal facility assessment inspections. During these inspections, maintenance deficiencies that can be observed – either seen or heard – are identified and recorded. The results are then sent over to different levels of government since they too directly have a stake in the infrastructure of a publicly funded University like McMaster. To avoid increasing the size of deferred maintenance backlogs, it is necessary to carry out replacement of facility components on an annual basis.

The responsibility for deferred maintenance primarily lies within the Institutional operating budget, with ancillary support provided by the Provincial and occasionally the Federal Government. On that note on June 24, 2011, the Government of Ontario released its long-term infrastructure plan, Building Together. The Plan makes it a requirement for all Ontario post-secondary institutions to produce an Asset Management Plan as a prerequisite for receiving infrastructure funding[1].

In Ontario, the Council of Ontario Universities (COU), through the Council of Senior Administrative Officers (CSAO) and the Ontario Association of Physical Plant Administrators (OAPPA), agreed to develop a Facilities Condition Assessment Program (FCAP) to catalogue infrastructure requirements associated with deferred maintenance, system and equipment renewal, and the required funding for the

[1] http://www.moi.gov.on.ca/en/infrastructure/building_together/index.asp

adaptation and on-going maintenance of the capital physical infrastructure of Ontario Universities. As such the MSU is able to utilize these results to gain a quantitative analysis of deferred maintenance at McMaster.

The index is called a Facility Condition Index which is a calculated a ratio of the value in dollars of Deferred Maintenance (DM) required for completion and the Current Replacement Value (CRV) of the building: thus, the lower the FCI, the better the condition of the building or portfolio. Another measure used is by Canadian Universities Reciprocal Insurance Exchange (CURIE) which utilizes a ratio of incurred losses for the Universities divided by the insurance premium they paid.

Maintenance landscape at McMaster

For starters in the aforementioned CURIE ranking of 58 member institutions, McMaster ranked very poorly with rankings of 39, 49, 53, 56 when Liability and Property rankings were matrixed with Loss ratio and Total Loss Dollars [2].

Similarly, Based on existing building audit data, McMaster's overall FCI is at 8.7%. A comparison of McMaster with the five peer Ontario Universities that comprise the G6 Universities(the others being Ottawa, Queen's, University of Toronto, Waterloo and Western) was performed using data from the COU report dated February 2010. The average FCI for these five universities is 8.4%. The FCI based on existing data indicates that McMaster, at 8.7%, is slightly higher than this average**.**

Concern one: The overall deferred maintenance sum for the University is estimated to be around $150 Million.

That being said, according to the 2012 Facility Services Asset management plan, the above figures still contain many additional costs that aren't part of the calculation, these include standardization, consulting fees, asbestos removal, enrollment growth and outdated data. Additionally, McMaster can be argued to have an artificially lowered FCI caused by newer construction (MDCL, Two new buildings by the faculty of Engineering etc), if we were to remove seven new constructions the FCI of older campus buildings which are still heavily used for teaching might be around 17%.

Critical Conditions

Facility Services has further broken down maintenance requirements through a five tier classification system. Facilities are classified as priority 1 if they are still in operation and are operating beyond their designed and useful life. Items in this category would include mechanical systems such as pumps, fans, and piping systems; electrical systems, including distribution and safety items; building envelope, such as windows, roofing and foundations; building finishes, such as flooring, acoustic ceilings and painting; and large utility items, such as steam or cooling generating equipment. These items have a high risk of failure,

[2] Attalla, M; Macdonald, C; Dunn, R. "McMaster Asset Management Plan". August 2012. Web: http://ppims.services.mcmaster.ca/pplant/documents/AssetManagementPlan-V01-Aug2012(Updated-05SEP12).pdf

a high operating maintenance cost, and in their current condition, a profound impact on building occupants and the core function of the building's operation[3].

Concern two: It is noted that McMaster's total DM backlog classified as critical (priority 1) amounts to over $50 million and by definition should be corrected within the next year. The deferred maintenance classified as potentially critical and necessary but not yet critical (priorities 2 & 3) totals over $100 million and should be addressed within the next 5 years.

According to a 2010 Council of Ontario Universities Government submission[4], Current figures indicate that the university sector has a backlog of deferred maintenance, totaling just under $2 billion. The university system has some $19.3 billion (Current Replacement Value – CRV) in building assets. The industry standard for annual maintenance of buildings is 1.5% of CRV. Funding for maintenance should, therefore, be in the order of approximately $290 million annually. Ontario universities, typically, receive only $27 million annually on average, which represents 0.16% of the CRV.

Any failure to adequately address deferred maintenance results in substandard facilities, and the breakdown of critical building systems and infrastructure as well as a huge barrier to teaching and learning advancements and student safety.

Based on the current replacement value of our facilities ($1.75 billion) and the 1.5% reinvestment in capital, annual spending on major maintenance for campus buildings should be at **$25.5million**. In 2011, Facility Services was only allocated total of $2.15 million for deferred maintenance, which represents just over 8% of the required industry-standard funding level. If this trend were to continue our FCI rating will further deteriorate to over 11% while our overall cost will progressively increase to $224 Million and above.

As stated before, the responsibility for deferred maintenance is shared between the Province and McMaster University and In 2007/08, the Province supplemented the regular Facilities Renewal Program (FRP) of $1.8 million with the Campus Renewal Program (CRP) at $9.16 million and the University Campus Renewal Fund (UCRF) at $13.5 million. These programs demonstrated Government's commitment to capital funding and deferred maintenance, and this funding contributed to McMaster's ability to sustain the FCI at 8.7%. However, this one-time funding has not stopped the growth in the total value of the DM backlog. Comparatively, The University of Ottawa is funding at $26 million per year, Western University at $11 million per year, and the University of Toronto at $10.8 million (but proposing an increase to $16 million) per year.

Unfortunately, from a political angle deferred maintenance funding isn't an appealing topic, therefore while McMaster did for example receive over $45 Million for the new Wilson Building for Humanities and Social Sciences in 2011; the DM funding for the rest of the campus was unaffected.

Recommendations

[3] Attalla, M; Macdonald, C; Dunn, R. "McMaster Asset Management Plan". August 2012. Web: http://ppims.services.mcmaster.ca/pplant/documents/AssetManagementPlan-V01-Aug2012(Updated-05SEP12).pdf (Page 9)

[4] http://www.cou.on.ca/publications/reports/pdfs/cou-submission_august-2010_mei-consultations-on-th

Based on the aforementioned description of deferred maintenance needs on campus the McMaster Students Union would like to endorse the following recommendations:

Recommendation 1: McMaster University at the very least invest $12.65 million per year to allow Facility Services to focus on critical DM requirements, while preventing the sudden failure of building components.

Recommendation 2: McMaster University create a long term plan to increase annual maintenance funding to $25 Million a year as proposed by the 2012 McMaster Asset Management Plan.

Recommendation 3: The Provincial Government prioritize addressing the Deferred Maintenance backlog at McMaster University by increasing its proportional share of directly funding DM to an industrial standard of 1.5% of CRV. This figure amounts to approximately $26 Million a year and will be a drastic increase from its current funding levels of approx 0.10% of CRV[5].

Sustained future efforts to increase the student population in Ontario must be matched by a commitment to invest in the necessary infrastructure funding, as well as deferred maintenance funds. This will ensure that Ontario students continue to receive a high quality education, where students are able to engage with innovative, diverse learning pedagogies, and have adequate study and laboratory space. Continuing to target enrolment growth without the necessary infrastructure and deferred maintenance investments will disadvantage students studying at Ontario institutions, and negatively impact student success, graduation rates, and retention. The Council of Ontario Universities estimated that in 2007 our universities had only 73 per cent of the space needed to support the current number of students, faculty and staff[6]. Deferred Maintenance is a necessary first step in ensuring McMaster University can support any additional and current students.

Similarly through projects like the Forward with Integrity letter by McMaster President Dr Patrick Deane as well as the Ministry of Training Colleges roundtable discussions on Innovation and Productivity in Summer 2012, the sector is increasingly discussing the role of technology in advancing traditional pedagogies. An outcome of this success is that infrastructure investments over the next decade will need to be more than bricks and mortar, and must include investments in technology. Research facilities, laboratories and classrooms need to be equipped with state-of-the-art or new technologies in order to attract and retain the best and brightest students and faculty. Moreover, the facilities and laboratories that house the technology often need to be adapted or modernized in order to accommodate it. Integrated use of technology in learning environments, such as classrooms, laboratories, libraries or student common areas, means significant adaptation of past architecture designed for a more static pedagogy, must be supported.

Universities are also moving away from traditional sage on stage structures. When faculty teach in more engaging and active ways – by giving students the opportunity to discuss and debate, or through approaches such as problem-based learning, and group discussions – students tend to become more

[5] "System Growth". Ontario Undergraduate Student Alliance. Spring 2012. Web: http://www.ousa.ca/wordpress/wp-content/uploads/2012/02/System-Growth.pdf

[6] Ontario Universities' Facilities Condition Assessment Program. Task Force of the Council of Senior Administrative Officers and the Ontario Association of Physical Plant Administrators. (Toronto: Council of Ontario Universities, March 2007).

actively involved and their potential for success is improved. This social trend has implications for university infrastructure, as it must be "transformed" or adapted to support active learning pedagogies.

An enhanced support for DM would give any new initiatives more flexibility.

Recommendation 4: Some elements of maintenance funding should be targeted at the repurposing of spaces to increase their viability in new pedagogy.

In the book Taking Stock the authors note that "Physical infrastructure inside and outside the classroom is often not designed to support active learning. Institutions could do a much better job of providing classrooms that are conducive to collaborative learning (e.g., with tables and chairs on castors), as well as space outside of class that promotes student interaction"[7]. Many innovative spaces at Ontario Universities have been constructed with funds provided by the recent federal and provincial infrastructure programs, such as the Lakehead Learning Commons. For schools seeking to show leadership through the promotion of collaborative and community based learning, efforts to provide the necessary infrastructure should be supported provincially. This will not only provide institutions another incentive to move to a collaborative teaching model, but would give them the resources to do it effectively.

[7] Christensen Hughes, J. and Mighty, J. (eds.). Taking Stock: Research on Teaching and Learning in Higher Education (Montreal QC and Kingston ON: McGill-Queen's University Press, 2010, pg 271).